INITIAL CARE OF OCULAR AND ADNEXAL INJURIES AT LEVEL I AND LEVEL II FACILITIES

Original Release/Approval		1 Aug 2007	Note: This CPG requires an annual review.	
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Supersedes:	Recommendations for Initial Care of Ocular and Adnexal Injuries at Level I and II Facilities			

1. Goal. To provide a step-by-step approach for the non-ophthalmologist in the care and treatment of ocular and adnexal injuries sustained in the combat theater.

2. Background. Despite comprising only 0.1% of the total body surface area, ocular and adnexal injuries are found in 5-10% of all combat casualties. Advances in both ballistic eyewear and acute ophthalmic surgical care have dramatically reduced the incidence of blindness associated with these injuries.

3. Evaluation and Treatment

a. Obtain a detailed history – specifically addressing whether ballistic eyewear was being worn correctly at the time of injury – and check visual acuity and compare to uninjured side.

b. Inspect eyes and adnexal structures using bent paper clips, if necessary, to elevate the upper eyelid **without placing pressure, either directly or indirectly, on the globe to assess for a ruptured globe**. (See Figure 1 below on how to make an eyelid retractor from a paperclip).

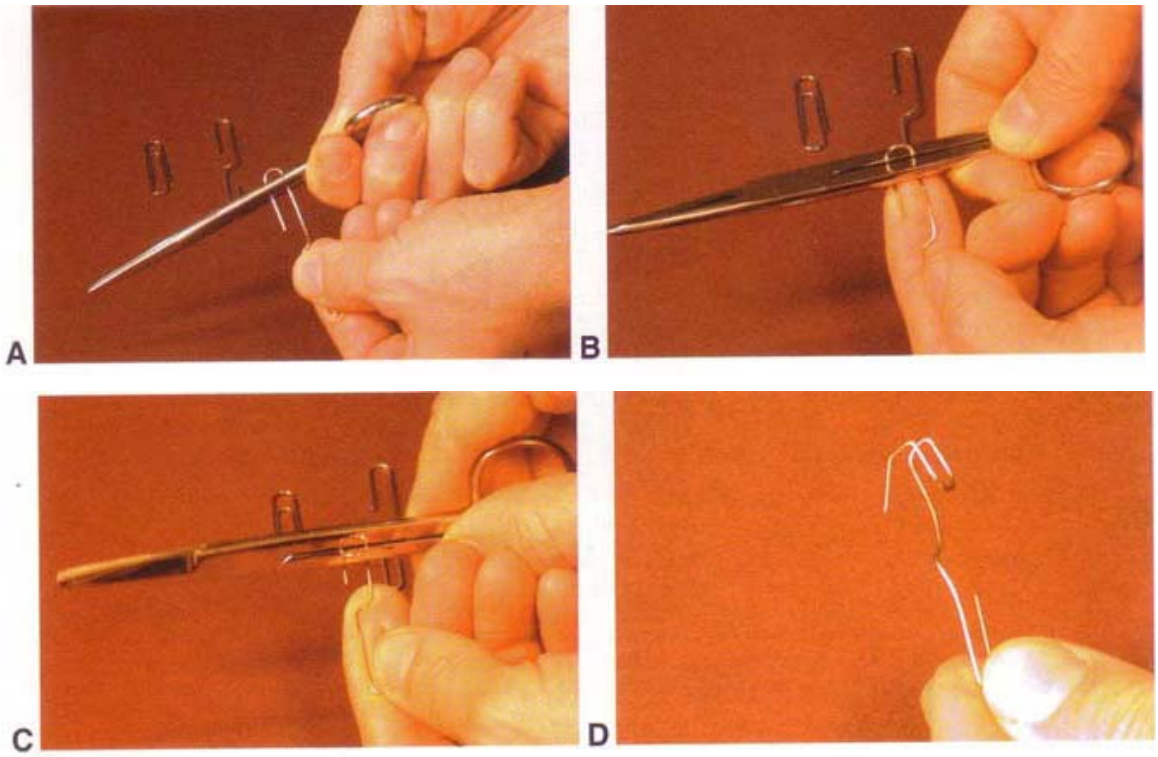

Figure 1

c. Superficial conjunctival or corneal foreign bodies may be irrigated away or removed with a moistened sterile swab under topical anesthesia. Apply ophthalmic antibiotic ointment.

d. **DO NOT remove impaled foreign bodies.**

e. Treat corneal abrasions with ophthalmic antibiotic ointment. Avoid patching.

f. Identify ruptured or lacerated eyeball by prolapse of intraocular tissues (such as iris or lens) through a wound (Fig. 2), hemorrhagic swelling of conjunctiva (Fig. 3), positive Seidel sign (Fig. 4) on the cornea, hyphema (blood in the anterior chamber), a very shallow or abnormally deep anterior chamber (compared to uninjured eye), a peaked pupil (Fig. 2), decreased extraocular motility, or severe vision loss. Do not apply pressure to the eye. Ask the patient not to strain or squeeze their eyelids. Tape a metal Fox shield over the eye or use the bottom cut out of a paper cup (Fig. 5) if a Fox shield is not available. **Do not apply a dressing or patch to an open globe. Do not use ointment on an open globe. Avoid interventions that induce nausea/vomiting.** Start Fluroquinolone antibiotic PO or IV (Ciprofloxacin 500 mg BID and begin an anti-emetic (Phenergan 50 mg or Compazine 10 mg IM/IV). Evacuate to an Ophthalmologist.

g. Uveal prolapse out a scleral wound. **The pupil is peaked toward the site of the rupture with some hemorrhagic chemosis (Figure 2).**

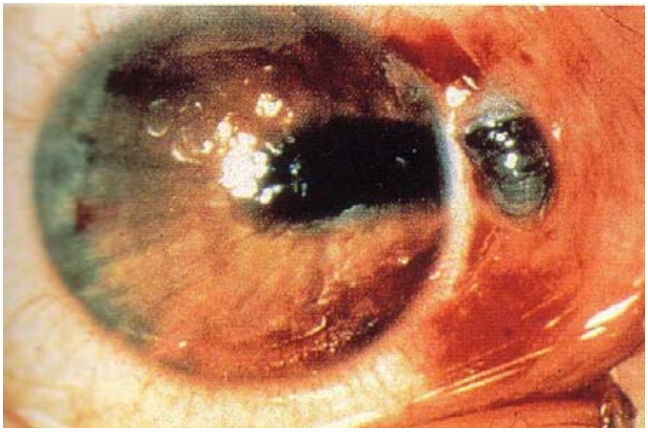

Figure 2

h. Hemorrhagic swelling of the conjunctiva or hemorrhagic chemosis is an ominous sign of a possible open globe (Figure 3).

Figure 3

i. A moistened fluorescein strip applied to the cornea can reveal aqueous flowing from a corneal wound by allowing one to visualize the flow of **aqueous fluid out of the eye (Figure 4)**.

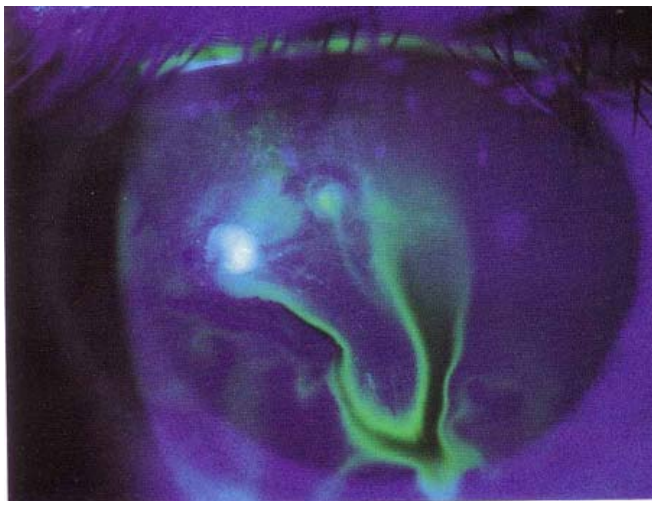

Figure 4

j. Protect an open globe with a metal shield or the bottom of a paper cup without an underlying dressing (Figure 5).

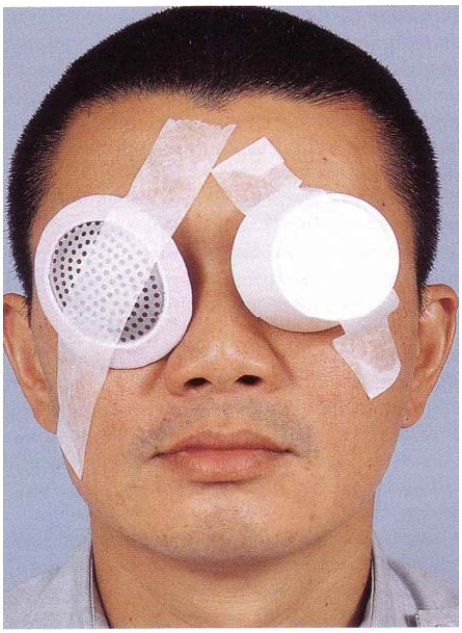

Figure 5

k. Anyone with possible intraocular foreign bodies – history of metal on metal strike, explosives, shrapnel, high velocity projectiles, etc., associated with eye injury, should be treated as one with a penetrating eye injury and evacuated to a Level III Ophthalmologist.

l. Never **provide topical anesthetics such as tetracaine or proparacaine for self medication.** Avoid prescribing topical corticosteroids.

m. For chemical burns, irrigate for 60 minutes while removing any particles from the eye. You must flip the upper eyelid (Fig. 6) and inspect the inferior fornix to evaluate for hidden **alkaline or acidic debris**.

n. Flip the upper eyelid by firmly holding the eyelashes and lifting up while pressing down on the middle of the eyelid with a paperclip or the shaft of cotton tipped applicator (Figure 6).

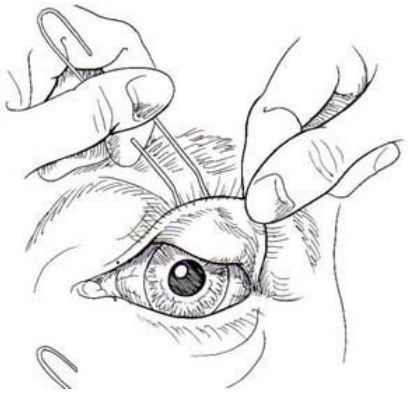

Figure 6

o. For severe injuries provide tetanus prophylaxis and begin systemic antibiotics (Fluroquinolone).

p. If you suspect orbital compartment syndrome from intraorbital bleeding – gross proptosis, tense tissues that are resistant to retropulsion (direct pressure), decreased vision, color vision loss, and Marcus Gunn pupil or afferent papillary defect – perform lateral canthotomy and cantholysis (see the *Emergency War Surgery Handbook* for specific details).

q. A Marcus Gunn pupil or afferent papillary defect is a sign of severe optic nerve dysfunction. The pupils are dilated in the dark. A bright light shone in an eye with a normal optic nerve will cause pupillary constriction of BOTH eyes. If one then swings the light quickly to the eye with optic nerve dysfunction both pupils will then dilate. Swinging the light back to the good eye cause constriction of both pupils again. This indicates that there is a left afferent pupillary defect (Figure 7).

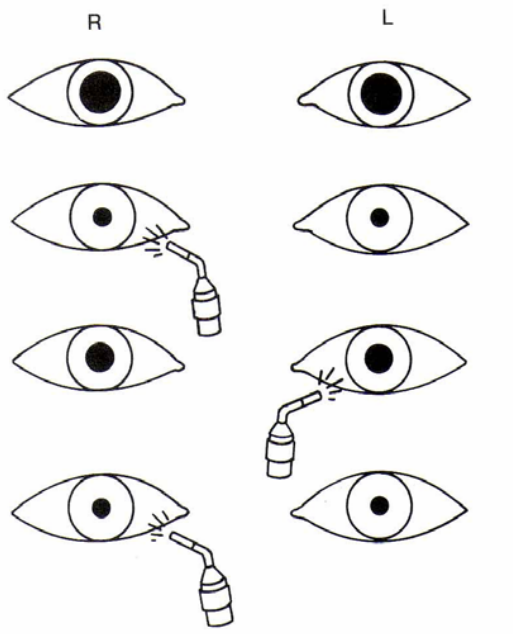

Figure 7

r. Patients with orbital floor fractures (blunt trauma with decreased extraocular motility, especially in vertical gaze and numbness on cheek) should be told not to hold in sneezes and not to blow their nose. May give systemic antibiotics and send for evaluation by Ophthalmology, ENT, or OMFS.

s. Only repair eyelid lacerations that: (1) do not involve the eyelid margin; and (2) are without fat prolapsing through the wound. After thoroughly irrigating the wounds they should be closed with 6-0 suture.

t. Eyelid lacerations that involve the margin or are deep with fat prolapse should be evacuated to a Level III Ophthalmologist with a moist dressing applied.

u. Laceration involving the margin of eyelid should be repaired by an Ophthalmologist (Figure 8).

Figure 8

v. Deep eyelid laceration that should be explored by an Ophthalmologist (Figure 9).

Figure 9

w. If there is eyelid tissue that is amputated or partially amputated, DO NOT discard. Wrap in moist gauze and send with patient.

x. Evacuate any patient with severe visual acuity loss after an injury to an Ophthalmologist as soon as possible.

y. If the cornea is exposed because of eyelid tissue avulsion, or retraction of eyelids due to burns, apply ophthalmic antibiotic ointment, cover the cornea, protect with a Fox Shield and evacuate to a Level III Ophthalmologist.

4. References

[1] BSCS series published by the American Academy of Ophthalmology

[2] Ophthalmic Care of the Combat Casualty

[3] Neuro-Ophthalmology by Frank J. Bajandas

[4] http://www.kellogg.umich.edu/theeyeshaveit/trauma/images/laceration-lid.jpg

[5] http://www.opt.pacificu.edu/ce/catalog/10310-SD/Trauma%20Pictures/Eyelid%20Laceration.jpg

Approved by CENTCOM JTTS Director, JTS Director and Deputy Director and CENTCOM SG